Altered N170 Response in a **Facial Oddball Task** in Persons with **High Depressive Symptoms**

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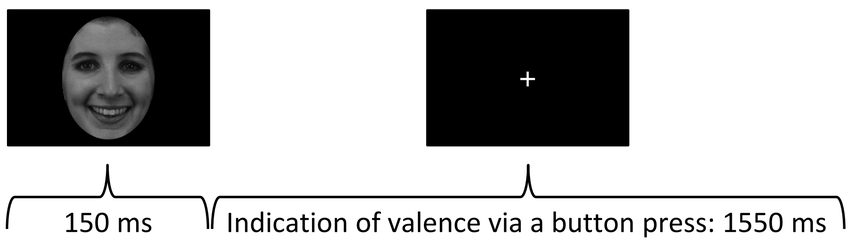
Introduction

- DSM-V main symptoms of depression are **depressed mood** and **diminished interest/pleasure** in activities
- Correspond well to
  - **Negative attention bias** (e.g., Beevers et al., 2015)
  - **Anhedonia** (e.g., Rizvi et al., 2016)
- Loneliness is a huge problem (e.g., Richard et al., 2017)
- **Goal:** Electrophysiological evidence for the presence of negative attention bias/anhedonia in early face processing

Methods

- Facial oddball task: 300 trials



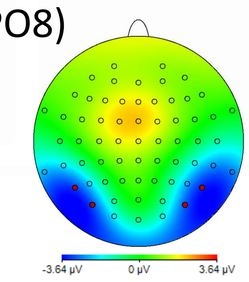
- While 80% of faces were in one gender (e.g., female), 20% were in the other gender (e.g., male)

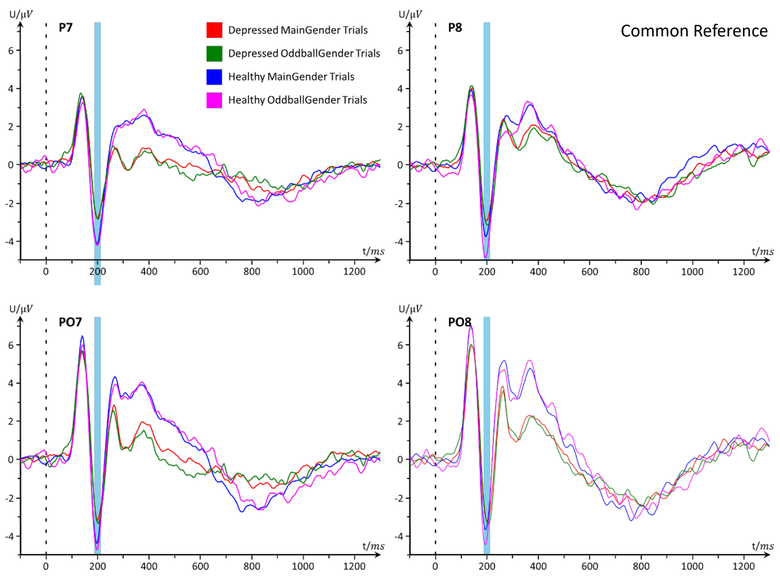
Results

- Extreme groups with very high and very low depressive symptoms (mean from prescreening and time of testing)

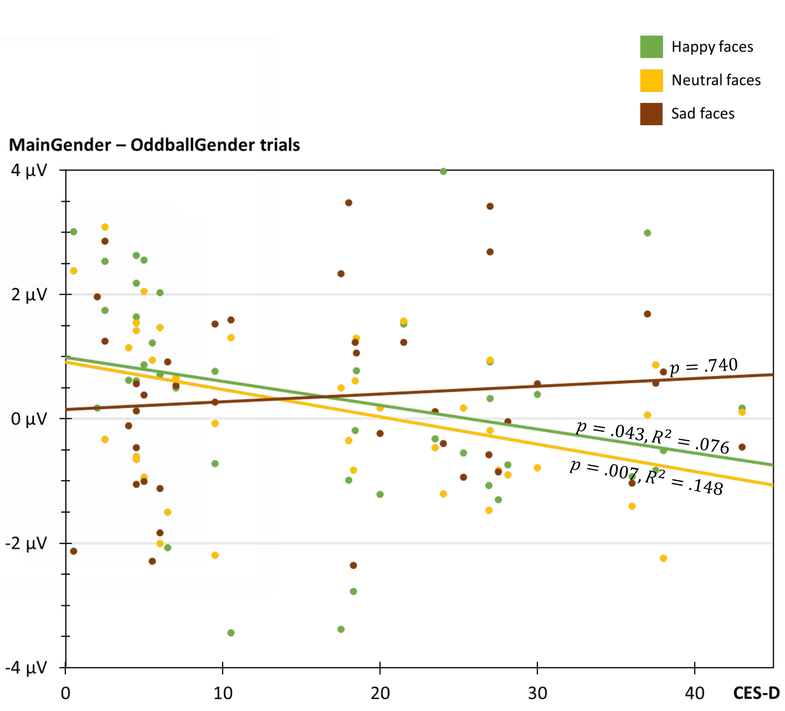
	Experimental group	Control group
N (female/male)	21 (16/5)	19 (14/5)
Age mean (SD) in years	19.10 (1.00)	19.11 (0.99)
CES-D mean (SD)	26.81 (7.66)	5.26 (2.60)
CES-D range	17.5 – 43.0	0.5 – 10.5

- Dependent variable: N170 (indicating face recognition; 186-206 ms poststimulus on electrodes P7, P8, PO7, and PO8)

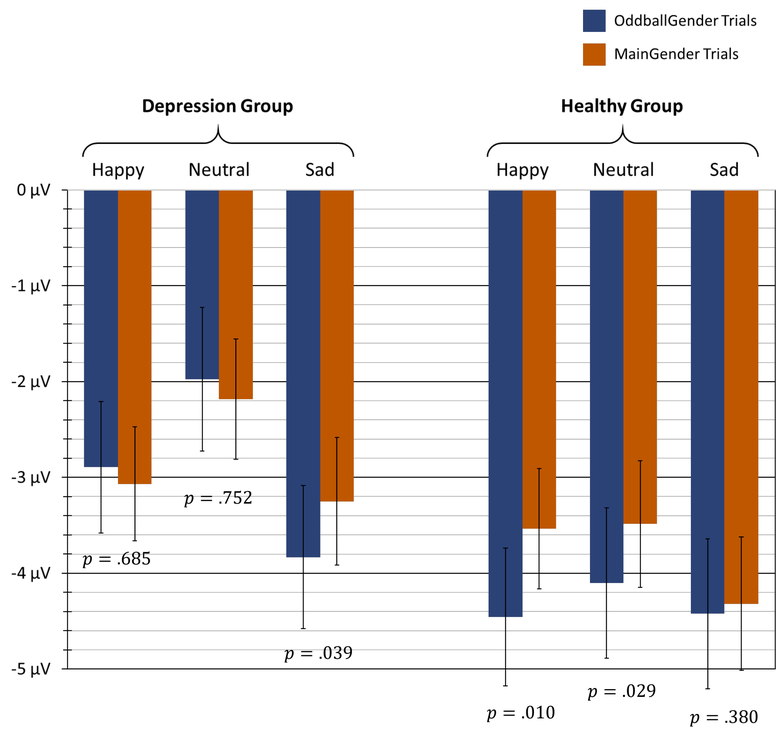




- **ME Oddball** ($F_{1;38} = 4.213; p = .047$): Amplitudes OddballGender > MainGender trials
- **INT Valence*Oddball*Depression** ($F_{2;76} = 3.445; p = .037$):



- Low amplitude differences between MainGender and OddballGender trials predict high depressive symptoms in happy faces ($r = -.275; p = .043$) or neutral faces ($r = -.384; p = .007$), but not in sad faces ($r = .105; p = .740$).



- Significant oddball effects in the depression group only after sad faces, in the healthy group only after happy and neutral faces

- Further effects:
  - INT Oddball*Position*Hemisphere ($F_{1;38} = 7.968; p = .008$): significant oddball effects on P8 and PO8, but not on P7 and PO7
  - ME Valence ($F_{2;76} = 10.420; p < .001$): amplitudes sad > happy > neutral

Discussion

- Already ca. 200 ms poststimulus strong attentional focus on negative, unexpected faces in the group with high depressive symptoms
- In early and therefore highly automatic process
- Results contradict often-cited popular belief that depression is solemnly a disorder of higher cognitive processes

Literature

Beevers, C. G., Clasen, P. C., Enock, P. M., & Schnyer, D. M. (2015). Attention bias modification for major depressive disorder: Effects on attention bias, resting state connectivity, and symptom change. *Journal of Abnormal Psychology, 124*(3). doi:10.1037/abn0000049

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